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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,186	03/17/2004	Zhi-Yuan Cheng	ASC-025DV2C1	3869

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EXAMINER	
HU, SHOUXIANG	
ART UNIT	**PAPER NUMBER**
2811	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/802,186	CHENG ET AL.	
	Examiner	Art Unit	
	Shouxiang Hu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *62-77* is/are pending in the application.

4a) Of the above claim(s) *72* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *62-71 and 73-77* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :4/26/04, 6/09/04, 11/12/04, 2/03/05, 4/07/05.

DETAILED ACTION

Election/Restrictions

1. Claim 72 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on December 04, 2006.

Information Disclosure Statement

2. The information disclosure statement (IDS) filed April 26, 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. Copies of foreign patent documents B1-B44 and non-patent literature publications C1-C97 listed in the above IDS are no found in the wrapper of the instant invention; and many of them cannot be found either in the previous applications that are parental to the instant application. Applicant is required to provide complete copies for these references, or, at least to identify which reference copies are filed in which of the previously filed parental or co-pending application.

Claim Objections

3. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 76-78 have been renumbered as claims 75, 76 and 77, respectively, as claim 75 did not exist originally in the amendment filed on March 17, 2004.

4. Claims 63-65, 73-76 (after renumbering) are objected to because of the following informalities:

Claims 63 and 74 each recite the subject matters of forming a device layer or device, but fail to clarify where the recited device layer or device is formed.

In claim 63, the term of "depositing said relaxed Si1-yGey layer" should read as: --splitting--, so as to better reflect the subject matter of the elected species.

Claims 65, 73 and 74 each recite the subject matters of removing a portion of said relaxed Si1-yGey layer, but fail to clarify from where the recited portion of the relaxed layer is removed.

In claim 75, the term of "of claim 75" should read as: --of claim 74--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 62, 67-71, 73 and 77 (after renumbering), as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 102(e) as being anticipated by Fitzgerald (US 6,602,613).

Fitzgerald discloses a method for forming a semiconductor structure (similar to what are shown in Figs. 3, 4, 6 and 7; also see col. 3, line 55, through col. 4, line 35; col. 6, lines 16-27; and col. 6, line 63, through col. 7, line 2), the method comprising: forming a first heterostructure (similar to what is shown in Fig. 3A) by depositing a naturally relaxed Si1-yGey layer (similar to 304) over a first substrate (similar to 300); bonding said first heterostructure to a second substrate (similar to 306) to form a second heterostructure (similar to what is shown in Fig. 3C); and splitting said second heterostructure along the naturally defective region formed through implanting naturally ions of hydrogen into the first heterostructure (see col. col. 6, lines 16-27; and, col. 6, line 63, through col. 7, line 2), wherein a portion of said first heterostructure remains on said second substrate after the second heterostructure is split (similar to what is shown in Figs. 3D and 6).

Regarding claims 67 and 70, the method of Fitzgerald further comprise the step of planarizing said relaxed Si1-yGey layer through CMP, before said step of bonding to the second substrate (col. 4, lines 12-20), and such a CMP step naturally includes cleaning (such as washing) the surface of the first heterostructure.

Regarding claim 71, it is noted that the step of splitting said second heterostructure in Fitzgerald is achieved through a splitting method that is based on implanting hydrogen ions into the first heterostructure, such a splitting method naturally comprises the step of annealing so as to fracture the implanted region.

Regarding claim 73, the method of Fitzgerald further comprises the step of removing at least a portion of said relaxed Si1-yGey layer from the second heterostructure (see col. 4, lines 33-36), after said step of splitting.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 66 and 76 (after renumbering), as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitzgerald in view of Yamauchi (Yamauchi et al., US 6,534,380).

The disclosure of Fitzgerald is discussed as applied to claims 62, 67-71, 73 and 77 above.

Fitzgerald does not expressly disclose that the method can further comprises a step of forming an insulating layer over said relaxed Si1-yGey layer as a bonding substrate before the bonding, and/or a step of reusing the remaining first heterostructure after the splitting. However, as evidenced in Yamauchi (see Figs. 1-11; also see: the abstract, col. 5, lines 1-11, col. 13, lines 22-26, col. 15, lines 51-54, and col. 16, lines 36-41), one of ordinary skill in the art would readily recognize that such insulating layer can be desirably formed so as to achieve better bonding by protecting the surface of the bonding substrate (i.e., the first heterostructure) during the ion implantation; and/or that the remaining bonding substrate (i.e., the remaining first heterostructure) can be desirably reused so as to reduce the manufacturing cost.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to develop the method of Fitzgerald by further including the step of forming the insulating layer over the relaxed Si1-yGey layer before the bonding, and/or the step of reusing the remaining first heterostructure after the splitting, per the teachings of Yamauchi, so that a method for forming a semiconductor substrate with better bonding therein and/or with reduced cost would be obtained.

9. Claims 63-65, 74 and 75 (after renumbering), as being supported by the elected species and as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitzgerald in view of Liaw (Liaw et al., US 5,891,769).

The disclosure of Fitzgerald is discussed as applied to claims 62, 67-71, 73 and 77 above.

Fitzgerald does not expressly disclose that the method can further comprises a step of forming a layer of strained Si after the splitting, one of the ordinary skill in the art would readily recognized that, as evidenced in Liaw (see the cover page figures), a layer of strained Si (14) can be desirably formed on a relaxed-SiGe-surface-based semiconductor substrate (including 12), for forming a field effect transistor with improved performance.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to develop the method of Fitzgerald by further including the step of forming the layer of strained Si on the relaxed Si1-yGey layer after splitting, per the teachings of Liaw, so that a method for forming a semiconductor device with improved performance would be obtained.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 62-71 and 73-77 are rejected on the ground of nonstatutory double patenting over claims 1-44 of U. S. Patent No. 6,573,126 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: a method forming a semiconductor structure comprising: forming a first heterostructure by depositing a relaxed Si1-yGey layer over a first substrate; bonding the first heterostructure to a second substrate to form a second heterostructure; and splitting the second heterostructure so as to have a portion of the first heterostructure remaining on the second substrate after the splitting.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-

1654. The examiner can normally be reached on Monday through Friday, 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SH
March 3, 2007.

SHOUXIANG HU
PRIMARY EXAMINER